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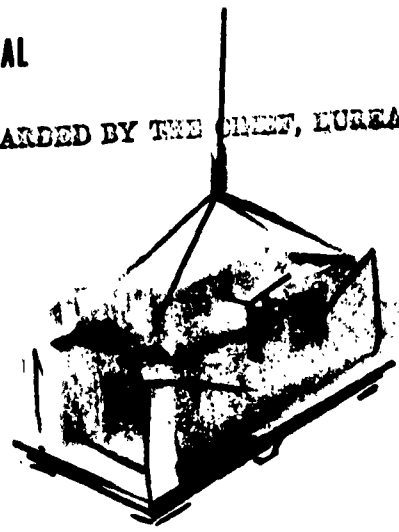

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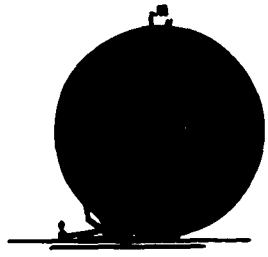

Letter of Progress

LIGHTWEIGHT, LONG RANGE EARLY WARNING RADAR

AN/TPS-36

CONTRACT No. NObsr 87072 - Dec 1962

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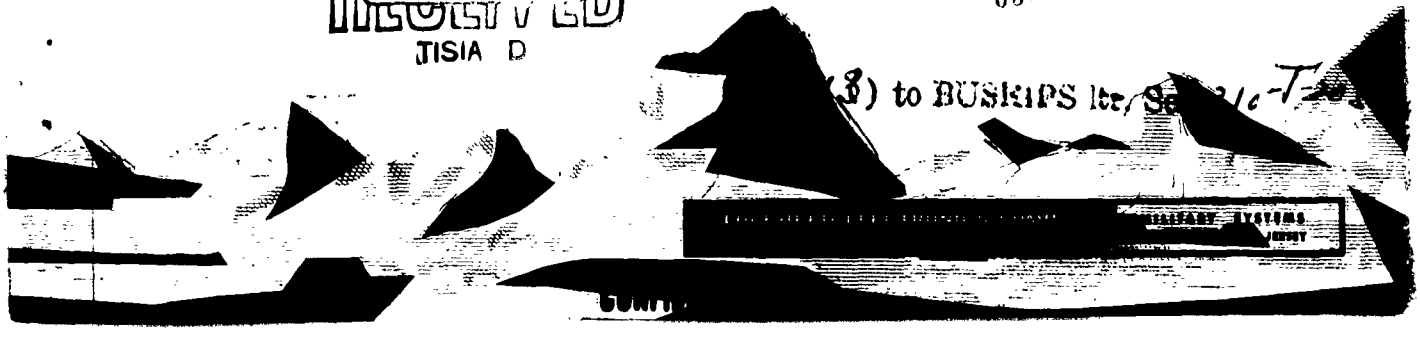

MONTHLY PROGRESS REPORT

ON THE

LIGHTWEIGHT, LONG RANGE

EARLY WARNING RADAR AN/TPS-36

This report covers the period from 1 December to 31 December 1962

Prepared by: H. H. Jamjyan
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Approved by:
A. J. Boss
Project Manager

Contract No.: NObsr 87072
LEC Case No.: 2/3/1251-1000
Date: 18 January 1963

OBJECTIVE

The objective of the effort under NObsr 87072 is to design, develop, and construct one (1) Service Test Model of a lightweight, long range, early warning radar equipment for tactical use by Marine Corps Air Control Squadrons in forward areas.

This equipment will be transportable by air lift and/or helicopter and will require a minimum of set-up time and maintenance. The entire system will be assembled within two transportable pallets and can be contained within a radome enclosure. The radar system must operate in a severe jamming environment and will contain several effective anti-jamming features.

TABLE OF CONTENTS

1.0 PROGRESS DURING THE REPORT PERIOD

1.1 GENERAL. This report is organized by major groups of associated equipment. The monthly progress is described in Section 1 and the planned effort for the next period is described in Section 2. A section on the status of Technical Manual effort has been added.

1.2 MODULATOR AND HIGH VOLTAGE POWER SUPPLY

1.2.1 High Voltage Power Supply, Unit 7. Assembly of the High Voltage Power Supply was completed during the report interval. The completed unit was tested and satisfactorily met unit test specification requirements. The tests were witnessed by Quality Assurance.

A back-up high voltage transformer was delivered to LEC from an outside vendor. The transformer weight was less than the LEC transformer but the heat rise was excessive and considerably above the specification requirements. In order to meet specification requirements is must be redesigned and will be considerably heavier. Consequently, this transformer is rejected and the order with the outside vendor is being cancelled.

1.2.2 Modulator, Unit 8. Delivery of the Modulator cabinet has been delayed by the cabinet vendor and consequently unit assembly will also be delayed. However, work is proceeding on the cables and subunits in the mock-up cabinet. The cables are 90% complete and the LPA/IPA/FPA Modulator sub-unit is also 90% complete. All other subassemblies have been completed.

1.3 TRANSMITTER, UNIT 3. The input match for the 200 MC Final Power Amplifier has been accomplished using a double $\lambda/4$ matcher to convert from 50 ohms to the tube impedance and a series tuning adjustment to account for tube-to-tube variations. One of the difficulties in obtaining an acceptable match has been the presence of third harmonic energy inherent in the output of the push-pull low band, Intermediate Power Amplifier. The input cavity accepted the fundamental frequency but rejected the third harmonic. The broadband directional coupler passed both the fundamental and third harmonic resulting in erroneous VSWR readings. The insertion of low pass filters (3A16 and 3A17) between the output of the Intermediate Power Amplifiers and their respective final amplifiers will eliminate this problem.

The input match for the 400 MC Final Power Amplifier is not yet acceptable. Due to operation at this higher frequency the first quarter wave is located well within the tube so a different design is required than at 200 mc. Design of this unit has been delayed by difficulties arising in developing a satisfactory broadband match over the band, at the input. The match is acceptable over half the desired band but must be broadened by reducing the reactive component effect. Work will proceed on obtaining a satisfactory input match, which is the major problem at hand.

The first air pump was received from Rotron and is in use in the 200 MC FPA breadboard.

The RCA A2766 Serial A1443 received during December 1962 indicated "anode breakdown" during initial firing. Serial F-4 received 12/3/62 was rejected for a mechanical fault, the anode radiator was separated from the anode block. Both tubes were returned to RCA on 12/6/62. Serial A1443 was found to be unstable. The "spot-knocking" process was performed and serial A1443 was returned to LEC. Serial F-4 was considered unacceptable and left at RCA. RCA has now agreed to process all A2766 tubes through their 70KV "spot-knocking" process before delivery to LEC.

The low band LPA Directional Coupler was rejected by QA for poor directivity. The 200 MC Intermediate Power Amplifier was satisfactorily unit tested and accepted by QA.

1.4 ANTENNA AND RF COMPONENTS, UNIT 10

1.4.1 Radar Antenna. During the last report period, fabrication and assembly of the antenna reflector, feed, and feed support was completed. The antenna, exclusive of the pedestal, was installed at the Lockheed antenna test range on Friday, December 28 inside the radome in preparation of antenna pattern tests. Preliminary data was taken on the overall impedance of the antenna feed system, but no pattern data was obtained. Because of the failure of the radome on December 31, 1962, pattern testing and impedance matching of the antenna feed have been temporarily suspended.

Antenna Feed. High power testing of the antenna feed has continued. Several changes have been made to the elements of the feed and also

in the balun structure. This included different element crossection, surface smoothness and finish, increasing the air interface at various points and pressurization. Heavy emphasis is being placed on finalizing the design of the feed to pass the maximum high power test.

Reflective Material. High power testing of the Duracote reflective material which serves as the antenna reflector surface, is continuing. After each sample is tested it is subjected to a microscopic examination to determine if there are any faults. To date there have been no failures of any type in the reflective material which can be attributed to illumination by RF high power levels. The samples were subjected to peak power density levels which are approximately 200% higher than the AN/TPS-36, and at an average power level density approximately equivalent to the AN/TPS-36.

Full Scale Antenna Testing. Full scale antenna testing was about to commence when radome failure occurred. As a result of the radome failure, pattern testing of the full scale reflector has been temporarily suspended.

RF Components. All RF components have been delivered to LEC with the exception of the subcontracted duplexer. The Rotary Joint and the 400 mc low-pass filter have successfully passed high peak power tests at 400 mc. The coaxial switches, both manual and motor driven, are being subjected to low power acceptance testing. The dummy load was submitted to LEC for Engineering evaluation and test,

prior to being submitted as a final deliverable end item. The dummy load is presently undergoing low power tests. When these tests are completed, peak power tests will be conducted on the dummy load as well as the coaxial switch. The dummy load will then be returned to the vendor for final assembly and refurbishing.

The duplexer has not been delivered on schedule due to technical difficulties encountered in high power operation. High power tests conducted at the 400 mc band on the duplexer revealed that the current density in the TR tubes was too high and the TR tubes were failing at average power levels of 1 kw. Non-uniform field distribution in the coaxial line in the vicinity of the TR tubes was also encountered. As a result of the tests, the duplexer vendor is presently modifying the duplexer design. New TR tubes and tube mounts have been designed and are presently being fabricated. The vendor anticipates successful high power testing of the duplexer during the latter part of January 1963. Because of these difficulties, vendor progress is being monitored closely. At least one written report a week as well as daily telephone reports are being submitted by the vendor.

1.5 RECEIVER AND CONTROL CONSOLE, UNIT 5 AND UNIT 1

1.5.1 Receiver, Unit 5. The cabinet was delivered the first week of January and assembly of the brackets and cables into the cabinet is approximately 80% complete. Sub-unit installation will begin as soon as the cabinet cabling is completed.

Procurement and tests have been completed on the coaxial bandpass filters which were added in the local oscillator coaxial cables to the 1st receive high and low band mixers. The filters were required to remove a crosstalk problem which occurs when the transmit loop is patched back into the receive loop for internal alignment and testing.

Gain control circuitry was added to the Test Panel of the receiver to permit adjustment of the gain of the 120 to 15 MC converter. The gain control is required to maintain a constant noise level into the matched filter for both the high and low bands.

The 15 MC Prelimit Amplifier has been tested and accepted by Quality Assurance.

The final versions of the Delay Line Assembly, Ultrasonic Delay Line and Synchronizer Delay Line have been inspected, tested and incorporated in the receiver breadboard.

The design of the Vacuum Tube RF Preamplifier (used in the low band) is nearing completion and release to Drafting is anticipated within the next few weeks.

1.5.2 Control Console, Unit 1. Assembly and testing of all subunits of the Control Console has been completed. Final QA acceptance of all subunits has also been completed.

Cabling of the mock-up cabinet has been completed, all subunits have been installed and the mock-up cabinet is now functioning as

a complete unit. The majority of the Engineering tests have been completed with satisfactory performance indicated to date.

1.6 POWER CONTROL AND LOW VOLTAGE POWER SUPPLY, UNIT 2. The cabinet delivery for Unit 2 has been delayed and is now scheduled for the third week in January 1963. The fabrication, functional test, and quality assurance inspection of all Unit 2 subunits is complete. The unit cabling, presently being fabricated in the mock-up cabinet, is approximately 75% complete. Drawings are being updated to include the recently added features which facilitate assembly and maintenance, such as additional connectors and terminal boards, more readily accessible mechanical hardware, additional cable clamps, and supports, etc.

System Interconnection. Delivery has been obtained on up to 95% of the system electrical connectors including receptacles, receptacle caps, plugs, plug caps, cable adapters and cable grips. Quotations for the fabrication of the complete cable sets per LEC Procurement Specifications have been received and are presently being evaluated.

1.7 SYSTEM MECHANICAL

1.7.1 Antenna

1.7.1.1 Antenna Reflector. The design and drafting effort on the antenna reflective surface is 100% complete. The fabrication of the four (4) reflective surface sections was completed on 12-18-62. Since completion, the reflective surface has been

installed several times on the reflector structure with satisfactory results. The Lift-A-Dot fasteners are presently inserted in a heavy nylon fabric disc which in turn is glued to the reflective fabric. The above design has performed satisfactorily during several trial installations, but for additional ruggedness the nylon fabric discs will be stitched to the reflective fabric.

The Lift-A-Dot studs are also presently assigned fixed positions along the steel reflector cables. The Lift-a-Dot studs are presently fixed on the steel reflector tension cables. LEC is considering the use of free sliding studs on the tension cables to reduce the field assembly time. If this technique improves the ease of field assembly, minor design changes and rework on the completed antenna will be required to accomplish the change.

The antenna reflector assembly with a temporary aluminum back-up structure was completed in December. The completed reflector was assembled on the wooden form to make a preliminary check of surface tolerances on the reflector surface. The largest deviation of the reflector surface from the surface of the form was found to be less than approximately $\pm$ .5 in maximum with the total average error being less than $\pm$ .15 inches.

Erection of the antenna reflector inside the radome was performed successfully as planned. The total erection time of the reflector from its assembled horizontal position to a final vertical position requires less than 5 minutes with four (4) men.

1.7.1.2 Antenna Pedestal. Heat transfer tests with the welded pedestal model have been completed and resulted in a further increase in the oil level. The increased oil level produced such favorable results that the manifold and fourth heater are no longer required. The manifold and fourth heater are now being considered as back up design in the event the final system behaves differently at -40°F. The three heaters will be operated on 115 volts instead of the original 200 volts. This arrangement eliminates the possibility of fire in the event the controls fail to shut the power off in a tropical climate.

The pedestal is being machined and the pedestal assembly is expected to be completed by mid-February. The turntable has been received and is being inspected. The two azimuth drive motors have also been received and are being inspected and tested. The drive gears have been received and are being assembled. The encoder is being assembled.

The design and drafting effort on the RF Assembly compartment is 100% complete. The major components have been procured and fabrication of the waterproof case and mounting brackets has begun. It is estimated that fabrication of components will be completed by the end of January 1963.

1.7.2 Radome. The radome was installed at the LEC antenna range on December 16, 1962 for performance evaluation and acceptance testing. Prior to the start of full scale antenna testing, on December 31, 1962, the radome failed and collapsed in very

severe winds. The exact reason for the failure has not as yet been determined. The radome will be returned to the subcontractor during the first week of January so that replacement can be effected at the direction of BuShips.

Equipment Pallet - Unit 4. Fabrication of the bottom section of the equipment pallet is complete except for the cabinet mounting hardware, crushable leg mounting and skids. Cabinet mounting is being coordinated with the cabinet vendor at this time. The crushable legs design is complete and the legs have successfully passed static testing. A series of dynamic tests are now being conducted to establish the final configuration of the legs.

The top pallet section has been completed and is ready for assembly.

Fabrication of the dummy frame is almost complete.

The main diagonal members have been partially fabricated with the remaining portion to be done at final assembly of the pallet.

Drafting layout and detailing of the equipment pallet assembly have been completed. As a result of the pallet and cabinet modifications, the dummy cabinets require minor modifications before being used in the exploratory engineering vibration and

drop tests. The dummy pedestal also requires minor modifications prior to being used in pallet testing.

Antenna Pallet. The titanium antenna pallet weldments were delivered to LEC by the vendor. The weldments were found to meet LEC dimensional specifications. A preliminary inspection of the titanium welds indicates that they are acceptable and meet LEC specifications. Because of the peculiarities of titanium welding, LEC stationed an Quality Assurance inspector at the vendor's plant during the final assembly welding phase of the titanium structure. The inspector reported compliance with the LEC Welding Specification.

Since the arrival of the titanium weldments at LEC the structures have been drilled and assembled as the antenna pallet. Brackets for mounting RF equipment in the pallet, are presently being fabricated and fitted to the pallet structure.

The fabrication of the skids for the titanium pallet is approximately 60% complete. The fabrication of the crushable legs for the pallet is progressing on schedule and it is anticipated that engineering drop tests of the pallet will start on 1-22-63.

A 200 hour salt spray test per MIL-E-16400D was conducted on a representative titanium welded joint sample. No trace of corrosion was detected as a result of the test. The above test was witnessed by the Resident Navy Inspector.

1.7.4 Equipment Cabinets. Assembly of the High Voltage Power Supply has been completed, and the unit is now undergoing environmental testing.

The Radar Receiver Cabinet has been delivered to LEC and is presently being assembled.

The Power Control and Low Voltage Power Supply Cabinet is expected to be delivered 1-16-63. Cabling in the mock-up cabinet is 100% complete. All bracketry and subunits completed and ready to be assembled into the cabinet when it arrives.

The remaining cabinets will be delivered in one week intervals starting with the Control Console cabinet which is scheduled for 1-18-63.

Constant surveilence has been put on the vendor's shop by our expediters to insure no further slippage in the latest schedule.

1.7.5 Compressor-Dehydrator, Unit 6. This assembly has been undergoing engineering acceptance testing in the Environmental Laboratory. Results to date regarding dew point of effluent air have been inconclusive because of the difficulties associated with precision of the measurement to be made (20 - 30 parts per million).

1.8 TECHNICAL MANUAL. Progress on the AN/TPS-36 Marine Corps Radar is now sufficient to permit the start of the writing effort on the Technical Manual. The proposed chapter breakdown for the Technical Manual for Radar Set AN/TPS-36 is as follows:

Chapter 1 - General Description

Chapter 2 - Installation

Chapter 3 - Operation

Chapter 4 - Technical Principles

Chapter 5 - Maintenance

Chapter 6 - Schematics

Chapter 7 - Parts List

Effort has begun on the preparation of the Technical Principles, chapter 4, and the chapter is approximately 30% complete.

2.0 PROGRAM FOR THE NEXT INTERVAL

2.1 MODULATOR AND HIGH VOLTAGE POWER SUPPLY. The High Voltage Power Supply will be subjected to exploratory engineering temperature and humidity testing during January 1963. These tests will be followed by exploratory shock and vibration testing.

The cabling of the mock-up Modulator cabinet is expected to be completed during the next month and testing of the LPA/IPA/FPA Modulator will also be completed.

2.2 TRANSMITTER. During next month all effort will be exerted on finalizing the 200 MC Final Power Amplifier and obtaining Q.A. acceptance of the two sections of the 400 MC Intermediate Power Amplifier. The second air pump is expected from Rotron and RCA is scheduled to complete delivery of all A2766's by the end of January 1963. Also during the next month a maximum effort will be exerted to provide a finalized 400 MC Final Power Amplifier.

2.3 ANTENNA AND RF COMPONENTS. The radome failure has resulted in the suspension of pattern testing and impedance matching of the antenna. There has not been sufficient time or information as yet, to formulate a new program. However, final fabrication and fitting of the titanium main antenna support can now be moved up in the schedule.

Performance testing of the reflective material under high power and extreme environmental conditions will continue.

High power testing of the antenna feed will continue. It is anticipated that a successful feed design will be obtained by the conclusion of the next report period.

It is anticipated that the duplexer will be delivered by the end of the next report period. This will complete delivery of all RF components.

2.4 RECEIVER AND CONTROL CONSOLE. The subunits will be removed from the breadboard racks and installed in the Receiver cabinet. Final cabling and debugging of the cabinet should be completed during January 1963. Unit test will then commence, with completion expected by the end of February.

Tests on the Vacuum Tube RF Preamplifier for the Low Band are expected to be completed and the subunit will be incorporated in the Receiver Unit.

Delivery of the Parametric Amplifier is expected in the second week of January 1963.

The late delivery of the Unit 1 cabinet will necessitate Q.A. acceptance of the Unit 1 electrical tests in the cabinet mock-up, with final acceptance occurring after installation of components

within the final cabinet. This procedure will minimize the delay in completion due to late cabinet delivery. Progress for the next period will thus include final electrical Q.A. acceptance of Unit 1, receipt of the final Unit 1 cabinet, and partial assembly of the final cabinet.

2.5 POWER CONTROL AND LOW VOLTAGE POWER SUPPLY. The Unit 2 cabinet is now expected in mid-January and the assembly is scheduled for completion by the end of January 1963.

Received bids for the system cables will be evaluated by Engineering and the order will be placed.

2.6 SYSTEM MECHANICAL

2.6.1 Antenna. During this interval it is anticipated that the titanium main antenna support will replace the temporary aluminum structure. The whole reflector will then be rechecked on the wooden form. One-quarter section of the Lift-The-Dot fasteners will be modified to provide a sliding and turning capability. That section of the reflector cloth will be assembled onto the reflector structure to ascertain whether this change reduces assembly time. If the above test is successful, all of the fasteners will be changed to the rotating, sliding type.

All components of the antenna pedestal will have been assembled except for the main-casting assembly. Receipt of the main-casting is expected by the end of the next report period. The azimuth-drive

motor and RF components (in the pedestal) will have been tested and ready for assembly.

2.6.2 Radome. It is anticipated that the radome will be in process of being repaired during the next report period, and the cause of the recent mishap will have been determined.

2.6.3 Equipment Pallet. Fabrication of entire equipment pallet assembly is scheduled for January with Engineering drop and vibration tests to be conducted in February.

The modifications to the dummy cabinets and pedestal are expected to be completed in January 1963. During the evaluation test, accelerometers will be placed at various points to record the load during the drop tests.

2.6.4 Antenna Pallet. The titanium pallet will have had various supports assembled to it and have undergone an Engineering drop test using sand bags to simulate the radome bag and antenna load. A vibration test will have been run to evaluate the vertical natural frequency using the same load as in the drop test.

2.6.5 Cabinets. The Power Control and Low Voltage Power Supply, the Control Console and the Modulator cabinets should all be completed and delivered to LEC during the next report period.

2.6.6 Compressor-Dehydrator. Final evaluation of the capability of the compressor-dehydrator under varying ambient conditions of

temperature and humidity will be completed. If improvements are required by the vendor, the unit will be sent back for modification.

2.7 INSTRUCTION MANUAL. Preparation of the Technical Principles section, Chapter 4, will continue during the next report interval and effort on the Installation section, Chapter 2, will begin.

3.0 PROJECT PERFORMANCE

3.1 SYSTEM AND ENVIRONMENTAL TEST. The System and Environmental Test Plan as presented heretofore must now be revised. As noted elsewhere in this report, the radome was lost on December 31, 1962. The loss of the radome is under investigation and a new schedule will be generated as quickly as the radome failure and its necessary correction can be analyzed and determined. The revised schedule will be based upon an estimate of receipt of a replacement radome.

Until this determination can be made, and planned for, the remainder of the program will continue and tests will be conducted without the radome and antenna and carried to a conclusion that the absence of the radome and antenna will permit.

The loss of the radome coincided with the start of antenna pattern tests which now cannot be conducted. Furthermore, the following antenna/radome tests scheduled for the time period January-February, in parallel with other work, cannot be accomplished until the radome is replaced.

(1) Full scale antenna pattern tests.

(2) VSWR match of feed on both bands in presence of reflector.

(3) Field intensity measurements of antenna near field.

(4) Evaluation and test of the radome and its control circuits.

(5) Drop tests of titanium antenna pallet with actual radome bags loaded for transport.

(6) Procedural tests and instructions to erect radome and assemble antenna and feed and auxiliary equipment (work in conjunction with Technical Publication writers for the Instruction Manual).

(7) Packaging radome on pallet within specified volume requirements for transport mode on antenna pallet (part of 5).

(8) Temperature and Humidity tests of radome in knockdown transport configuration.

(9) Final antenna pedestal tests to measure windmill torque inside radome, while antenna is rotating.

(10) Final determination of whether radome and equipment pallet can be erected within the radome at its final position (to save manhandling the equipment pallet into final position).

(11) Test of auxiliary transmitter booster blower working with inflation unit to rapidly erect radome.

(12) System test in the near field of the antenna.

(13) As a consequence of many of the above noted tests, it is expected that various units/subunits of the radar set will require modifications or design fixes which would have been introduced or corrected <u>in parallel</u> with the other test effort and assembly now currently going on. The antenna test effort was scheduled to

parallel this effort (in time) so that changes could be introduced as they occurred and before other units of the system were complete. With the loss of the radome and antenna testing, these fixes can be introduced only at a future time which places the effort in series with the test program thus undesirably extending the interval. Furthermore, any necessary changes at this later date brought about the test results of the radome/antenna must be made on finished equipment necessitating modifications to a final equipment and repeating those portions of the system test as necessary.

(14) All Instruction Book data concerned with the radome and antenna and their respective assembly and disassembly procedures must cease or continue on a limited basis pending the re-initiation of this effort. Meanwhile, other data and instruction book effort will proceed, but it is strongly subject to later revision as a result of radome and antenna tests which affect other units of the system. For example, the full scale antenna and antenna feed tests will definitely affect Unit 3 (Transmitter group), Unit 5 (Receiver) and the RF components (Duplexer, Diplexer, Coax Switches, Rotary Joint, etc.), particularly with respect to VSWR match, power handling, noise figure of pre-amplifiers, etc.

The radome has been returned to the supplier (Berger Brothers) who is examining and reconstructing the events leading to the failure. Sample material is being tested from the failed sections to determine the cause of the failure, how to correct it, and provide estimates for this correction.

The system test cannot now be conducted as originally planned, within the radome erected at the Plainfield LEC facility. Initial thinking, in view of this failure, subject to approval, is to mount units, as they are completed, on the equipment pallet in electrically associated groups to test as a group, ultimately providing the entire system test except for antenna. The system test will be conducted in the LEC lab. The transmitter would terminate in a dummy load and everything that could be tested would be tested except for actually tracking aircraft targets.

Two associated groups as functional entities exist: namely Units 1, 2 and 5, respectively the Control Console, the Power Control Unit and Low Voltage Supply, and the Receiver; Units 3, 7 and 8 and the RF Components, respectively the Transmitter group, High Voltage Power Supply, Modulator and RF components are the second group of electrically associated equipments.

The loop between the transmitter and the receiver may be closed, for test purposes, by providing a temporary antenna (possibly the TPS-36 feed without reflector, if VSWR permits) to observe targets, clutter and pulse compression performance.

The "recovery schedule" is currently under consideration as this report is being written and will be covered in more detail in the next report interval. It is planned that the system tests will commence in a limited way subject to the above described during the next report interval.

3.2 WEIGHT SUMMARY REPORT. The system weight is now estimated to be 7094 pounds which is 101 pounds above the previous weight estimate. The Power Control and Low Voltage Power Supply increased eight pounds because of an increase in component weights. The High Voltage Power Supply increased 15 pounds because of the inability of the vendor's lightweight transformer to meet the heat rise specifications. The radome weight increased because the final inflator unit gained 37 pounds. The antenna legs increased 35 pounds because the actual titanium pallet weight was 20 pounds higher than the estimate and the parametric amplifier weight estimate was increased.

January 1, 1963

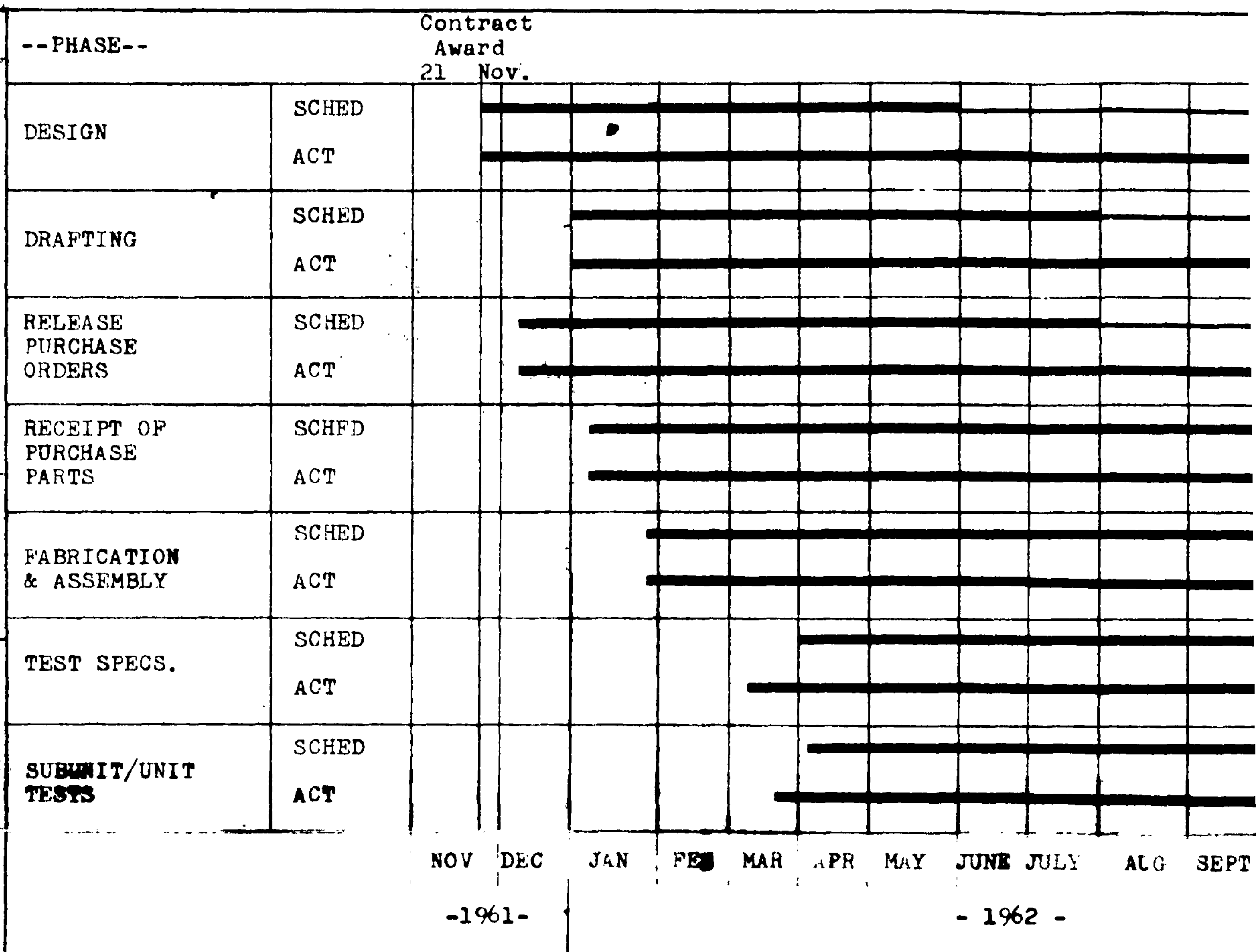
AN/TPS-36 WEIGHT REPORT

Unit	Name	Est. Weight Proposal	Est. Weight Present	Actual	Gain or Loss
1	Shelter Control Console	150 235	25 365		+5
2	Power Control and Low Voltage Power Supply	342 140	359		-123
3	Transmitter Low Transmitter High	313 287	420		-180
(4) 4	Equipment Pallet	81	408		+327
5	Radar Receiver	241	358		+117
6	Compressor-Dehydrator	25		23	-2
7	High Voltage Power Supply	314	240		-74
(3) 8	Modulator and Power	353	400		+47
9	Radome Complete	2062	2153		+91
10	Antenna Reflector Antenna Feed	903	804		-99
(2)	Antenna Pedestal Antenna Legs	626	413 639		+426
(1)	Misc. RF Equipment	269	---		-269
	Primary Power Interconnecting Cable (150 ft)	110	180		+70
	System Interconnecting Cable		88		+88
	Control Console Cable (150 ft.)	85	179		+94
	MTDS Cable (100 ft.)	---	40		+40
	Sub-Total		7071	23	
	GRAND TOTAL	6536	7094		+558

(1) Located in Pedestal Legs
(2) Antenna Pallet, crushable legs, straps and junction boxes now included in Antenna Legs.
(3) Includes weight of 2 LPA units originally in Unit 3
(4) Includes skids

NObsr 87072 AN/TPS-36 REP

* SCHEDULE FOR OVERALL SYSTEM



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LOCKHEED ELECTRONICS COMPANY PLAINFIELD, N. J.

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REPORT INTERVAL [illegible] 1962 to DEC 1963

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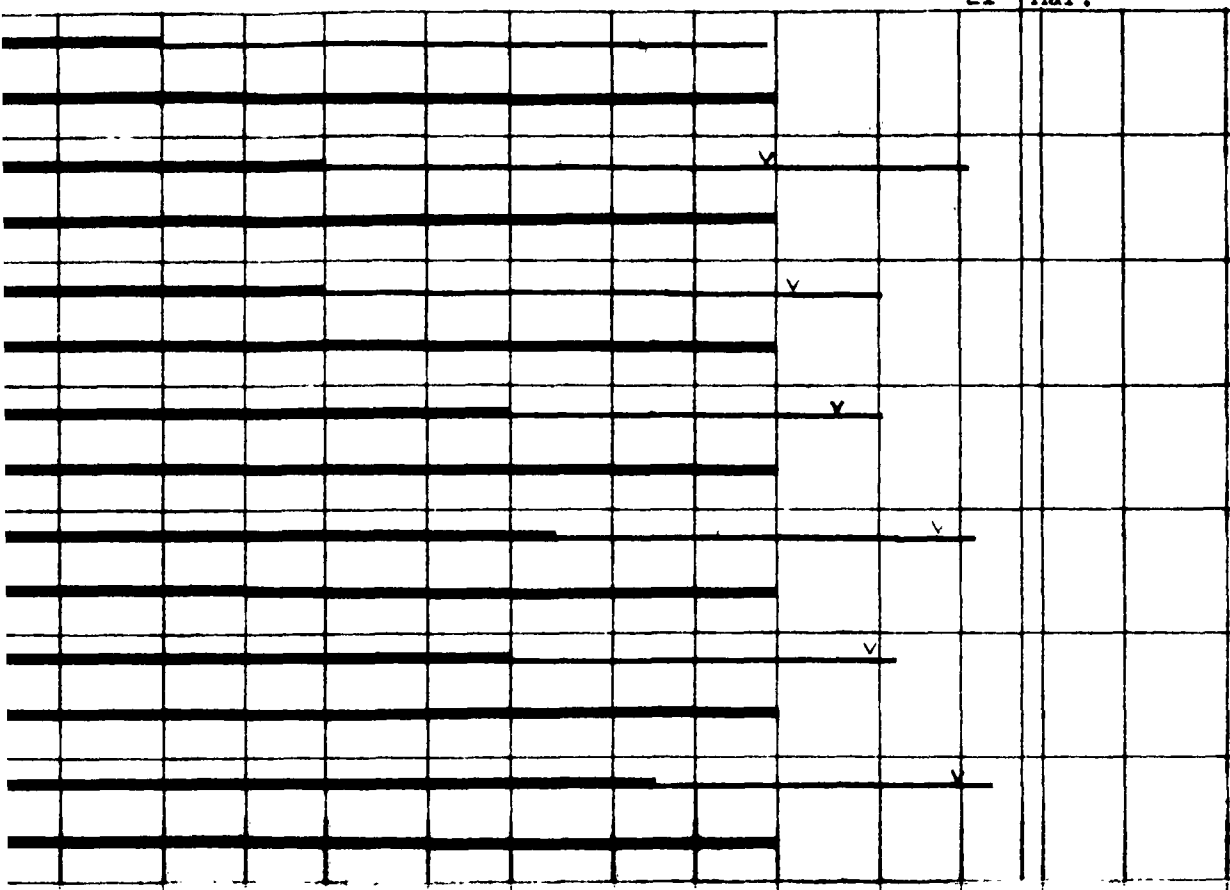

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SYSTEM

NObsr 87072 AN/ZPS-36

SCHEDULE FOR -- UNIT 1, CONTROL CONSOLE

- PHASE -

CONTRACT AWARD 21 NOV

DESIGN	SCHED	
	ACT	COMPLETED
DRAFTING	SCHED	
	ACT	
RELEASE PURCHASE ORDERS	SCHED	
	ACT	
RECEIPT OF PURCHASE PARTS	SCHED	
	ACT	
FABRICATION & ASSEMBLY	SCHED	
	ACT	
TEST SPECS.	SCHED	
	ACT	
SUBUNIT/UNIT TESTS	SCHED	
	ACT	

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T 1, CONTROL CONSOLE & SHELTER

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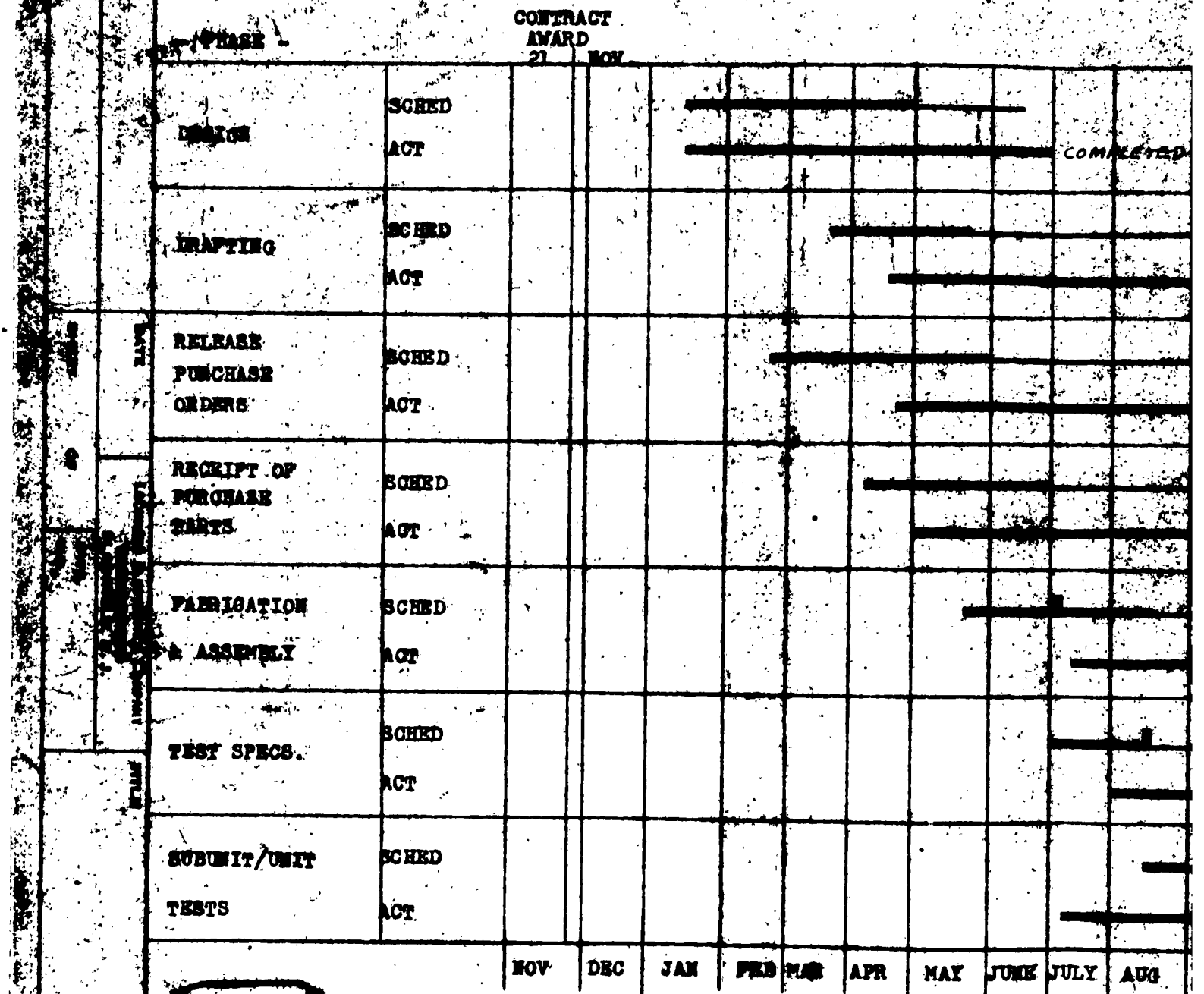
UNIT 1

SCHEDULE FOR -- UNIT 2, POWER CONTROL



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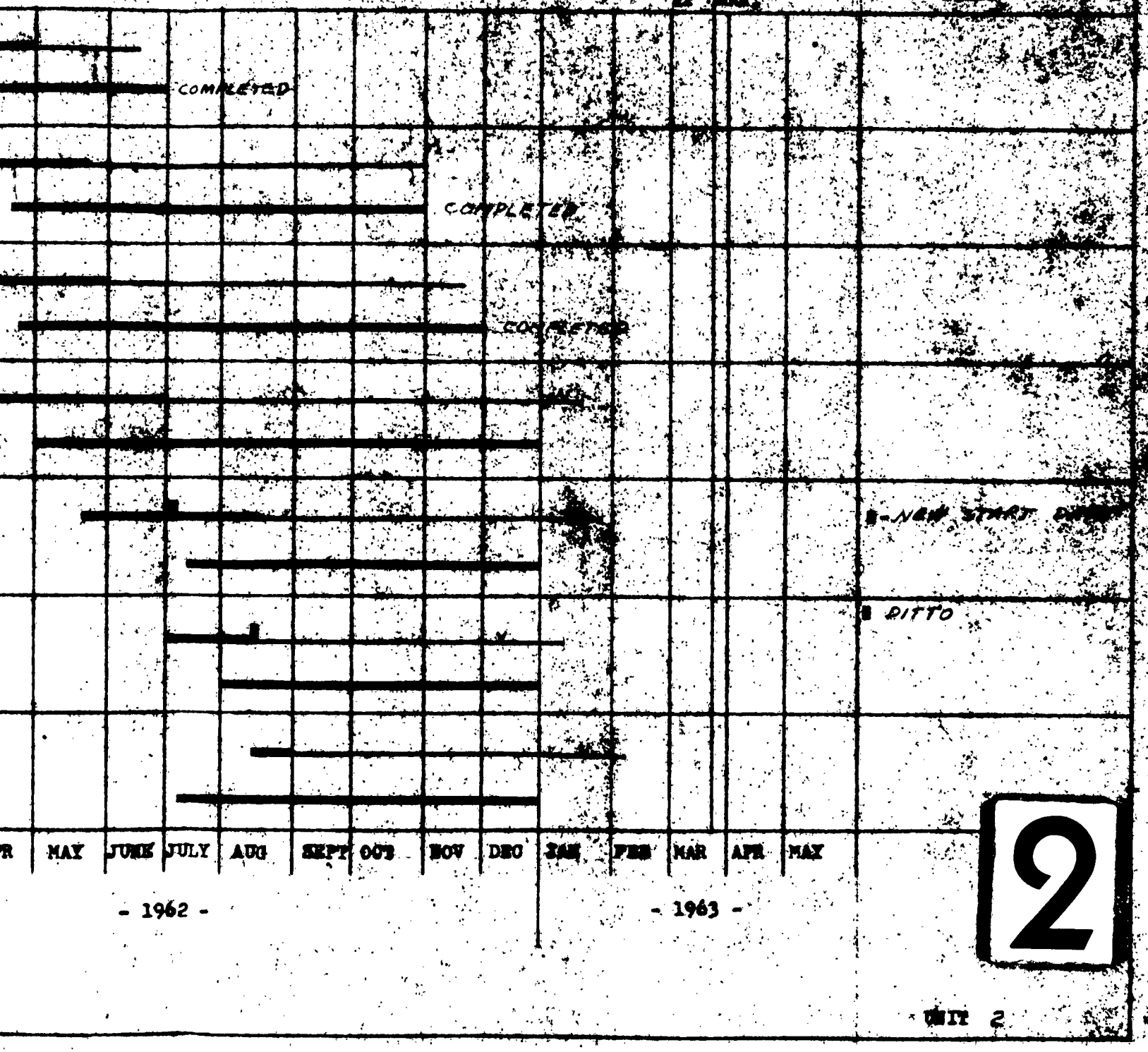
TPB-36

IT 2, POWER CONTROL & LOW VOLTAGE SUPPLY



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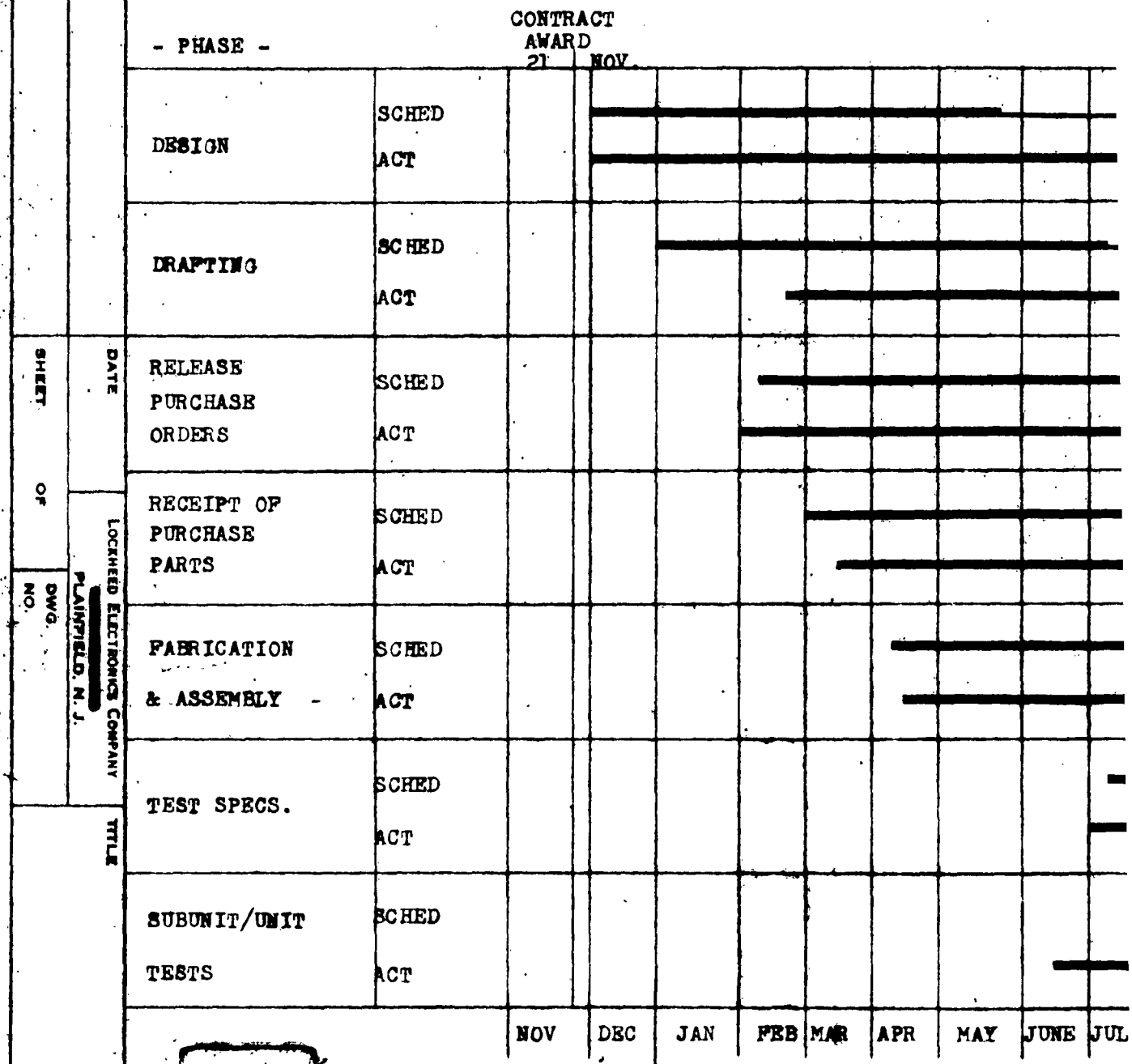
UNIT 2

NObsr 87072 AN/TPS-36

SCHEDULE FOR -- UNIT 3, TRANSMI



SHEET OF

DWG. NO.

DATE

LOCKHEED ELECTRONICS COMPANY PLAINFIELD, N.J.

TITLE

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REPORT INTERVAL 1 NOV 1962 TO 1 DEC 1962

TPS-36

DWG. NO.

UT 3, TRANSMITTER GROUP

DEL. 21 MAR.

- NOTES -

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MAY JUNE JULY AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY

- 1962 - - 1963 -

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UNIT 3

Nober 57072 AN/[illegible]-36

SCHEDULE FOR -- UNIT 4, EQUIPMENT [illegible]

- PHASE -		CONTRACT AWARD 2 NOV
DESIGN	SCHED	
	ACT	
DRAFTING	SCHED	
	ACT	
RELEASE PURCHASE ORDERS	SCHED	
	ACT	
RECEIPT OF PURCHASE PARTS	SCHED	
	ACT	
FABRICATION & ASSEMBLY	SCHED	
	ACT	
TEST SPECS.	SCHED	
	ACT	
SUBMIT/UNIT TESTS	SCHED	
	ACT	

NOV DEC JAN FEB MAR APR MAY JUNE JULY AUG SEP

- 1961 - - 1962 -

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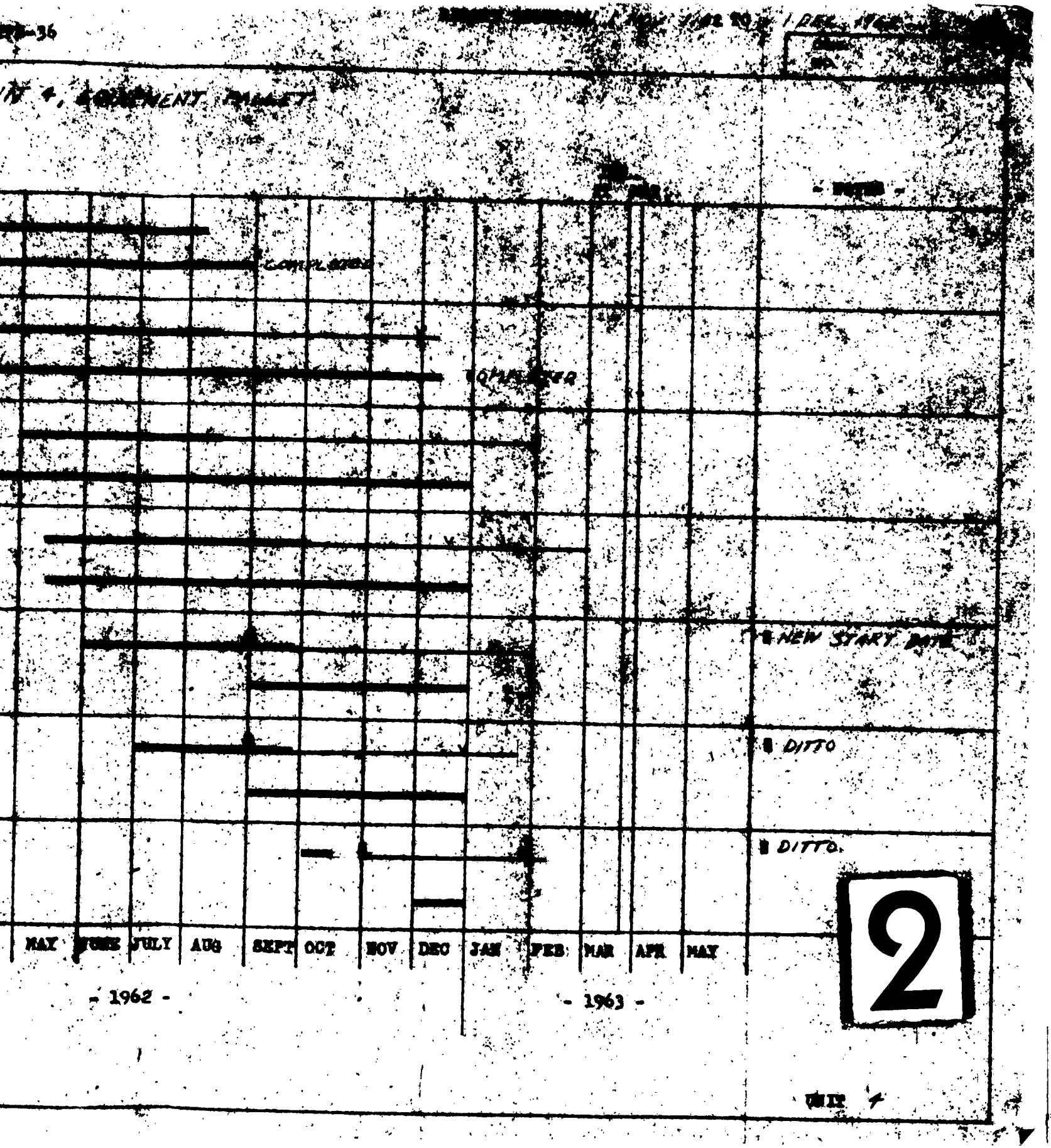
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- 1962 -
- 1963 -
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NObar 87072 AN/TPS-36

SCHEDULE FOR -- UNIT 5, RECEIVER

- PHASE -		CONTRACT AWARD 23 NOV.
DESIGN	SCHED	
	ACT	
DRAFTING	SCHED	
	ACT	
RELEASE PURCHASE ORDERS	SCHED	
	ACT	
RECEIPT OF PURCHASED PARTS	SCHED	
	ACT	
FABRICATION & ASSEMBLY	SCHED	
	ACT	
TEST SPECS.	SCHED	
	ACT	
SUBUNIT/UNIT TESTS	SCHED	
	ACT	

NOV DEC JAN FEB MAR APR MAY JUNE JULY AUG SEPT

- 1961 - - 1962 -

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DWG. NO.

LOCKHEED ELECTRONICS COMPANY PLAINFIELD, N. J.

TITLE

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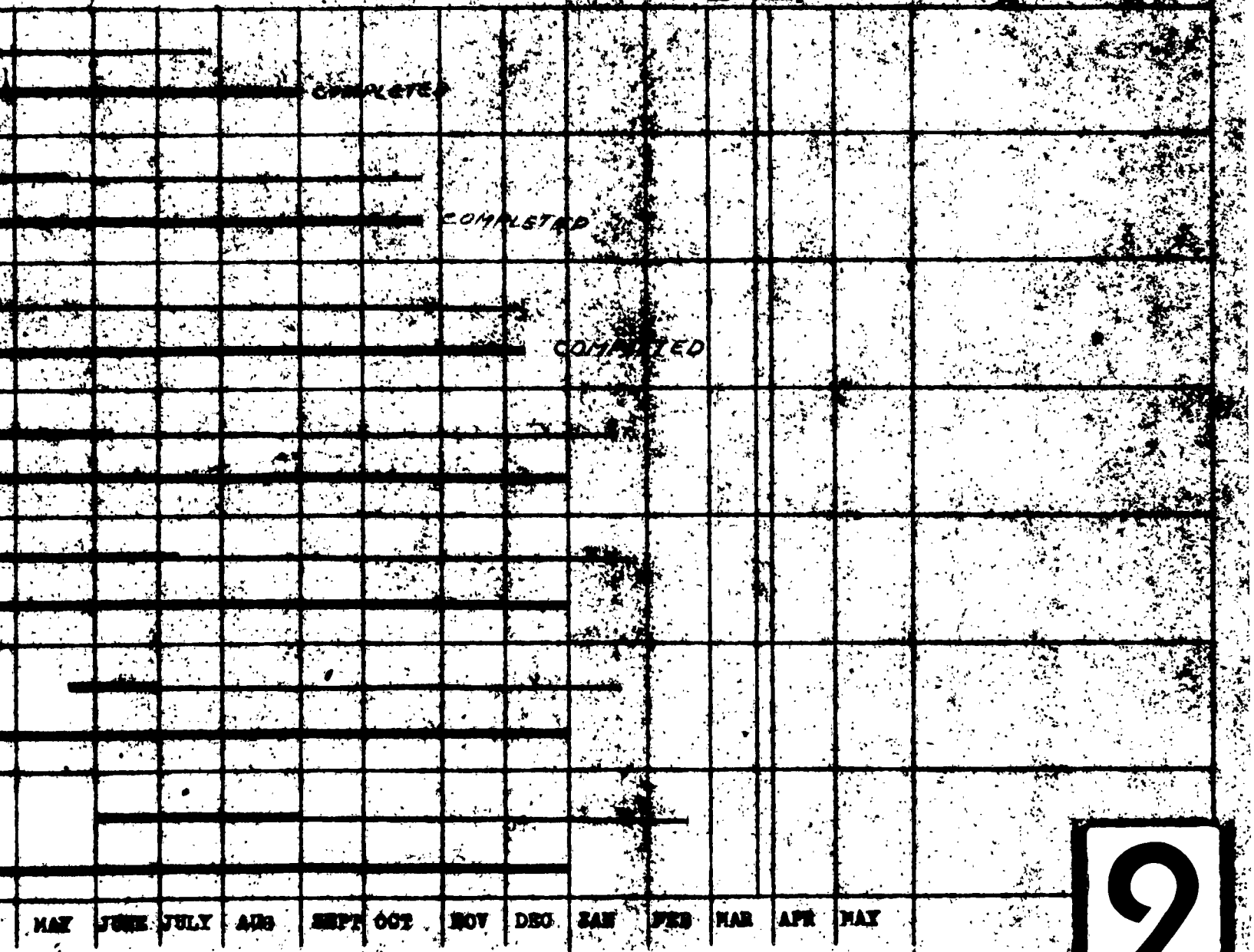
T 5, RECEIVER

1 DEC 1962

DWG. NO.



2

UNIT 5

NObar 87072 AN/TPS-36

SCHEDULE FOR -- UNIT 6, COMPRESSOR-DEHY

CONTRACT AWARD 21 NOV.

- PHASE -		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
DESIGN	SCHED											
	ACT											
DRAFTING	SCHED			PURCHASED ITEM								
	ACT											
RELEASE PURCHASE ORDERS	SCHED											
	ACT											
RECEIPT OF PURCHASE PARTS	SCHED											
	ACT											
FABRICATION & ASSEMBLY	SCHED			PURCHASED ITEM								
	ACT											
TEST SPECS.	SCHED											
	ACT											
SUBMIT/UNIT TESTS	SCHED											
	ACT											

COMPLETED

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- 1961 - - 1962 -

SHEET 1 OF 1 SHEETS

DWG. NO.

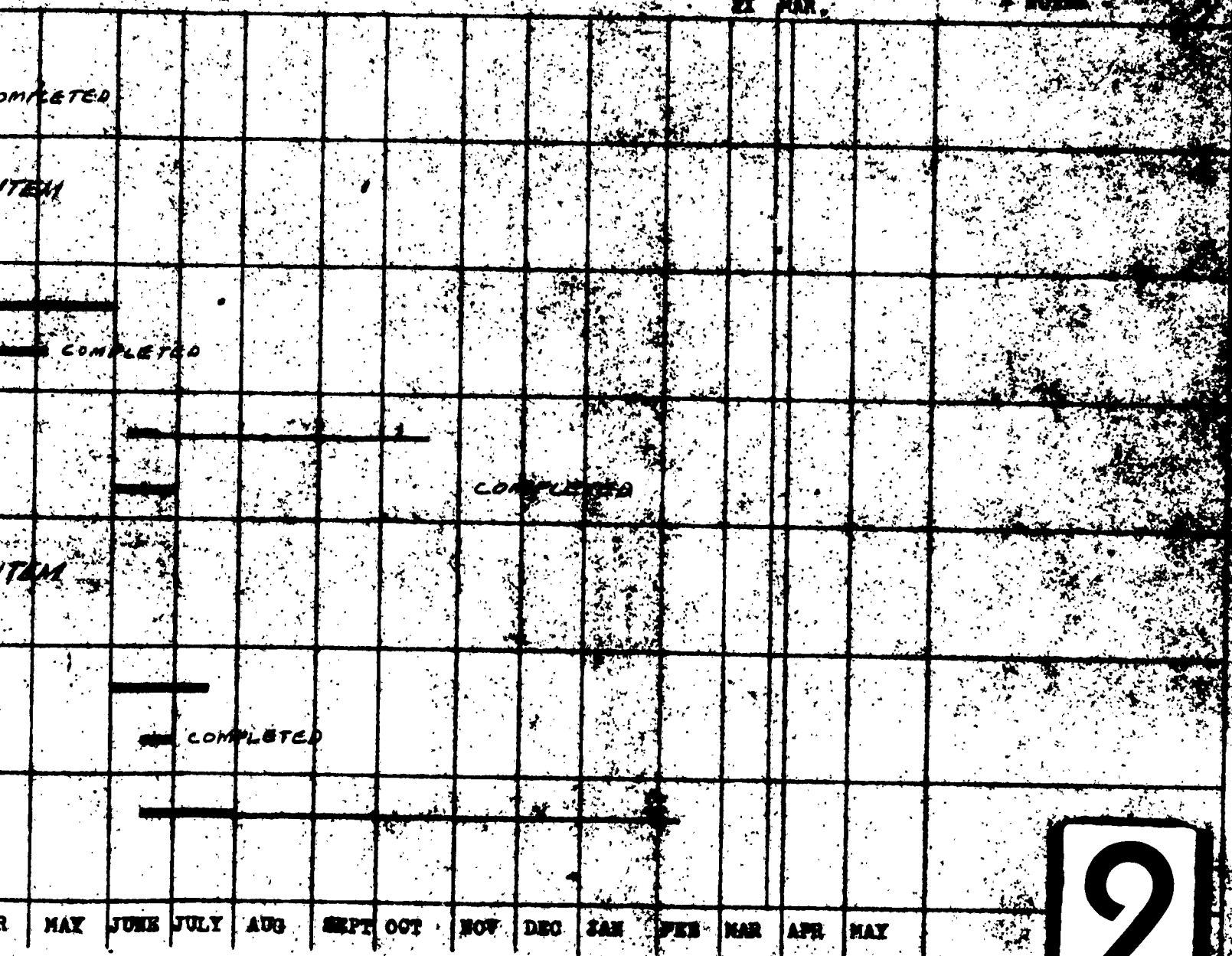
DATE

TITLE

LOCKHEED ELECTRONICS COMPANY
PLAINFIELD, N.J.

TP8-36

NIT 6, COMPRESSOR - DEHYDRATOR



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UNIT 6

NObsr 87072 AE/TPS-36

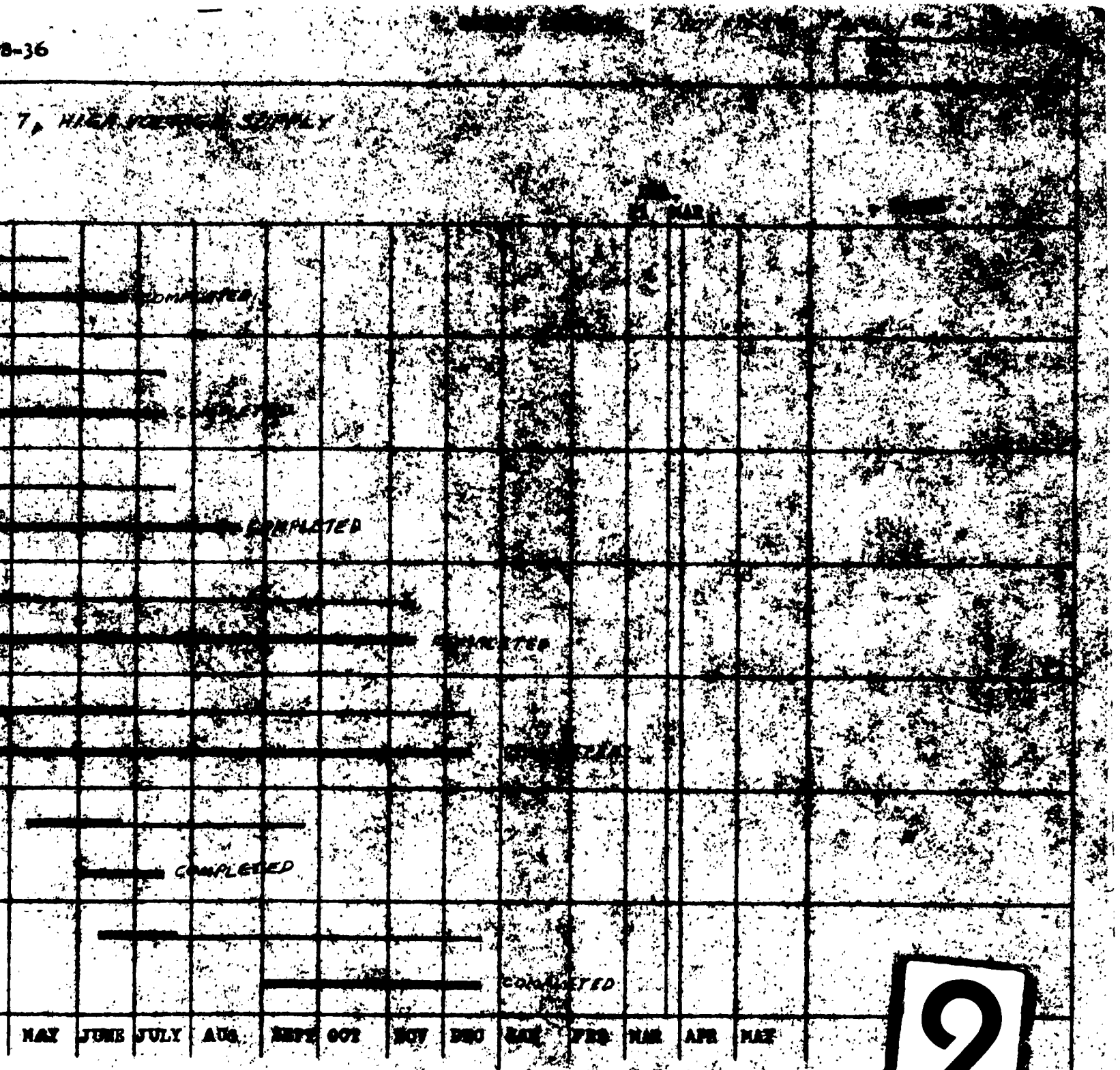
SCHEDULE FOR -- UNIT 7, HIGH POTENCY SONAR

- PHASE -		CONTRACT AWARD 23 NOV	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
DESIGN	SCHED												
	ACT												
DRAFTING	SCHED												
	ACT												
RELEASE PURCHASE ORDERS	SCHED												
	ACT												
RECEIPT OF PURCHASE PARTS	SCHED												
	ACT												
PREFABRICATION & ASSEMBLY	SCHED												
	ACT												
TEST SPECS.	SCHED												
	ACT												
SUBMIT/UNIT TESTS	SCHED												
	ACT												

- 1961 - - 1962 -

1

7. HIGH VOLTAGE SUPPLY



2

FORM NO. F1C8A

NObsr 87072 AN/TPS-36

SCHEDULE FOR -- UNIT 8, MODULATOR & A

- PHASE -		CONTRACT AWARD 21 NOV.	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG
DESIGN	SCHED										
	ACT										
DRAFTING	SCHED										
	ACT										
RELEASE PURCHASE ORDERS	SCHED										
	ACT										
RECEIPT OF PURCHASE PARTS	SCHED										
	ACT										
FABRICATION & ASSEMBLY	SCHED										
	ACT										
TEST SPECS.	SCHED										
	ACT										
SUBUNIT/UNIT TESTS	SCHED										
	ACT										

- 1961 - - 1962 -

SHEET OF

DWG. NO.

DATE

LOCKHEED ELECTRONICS COMPANY PLAINFIELD, N. J.

TITLE

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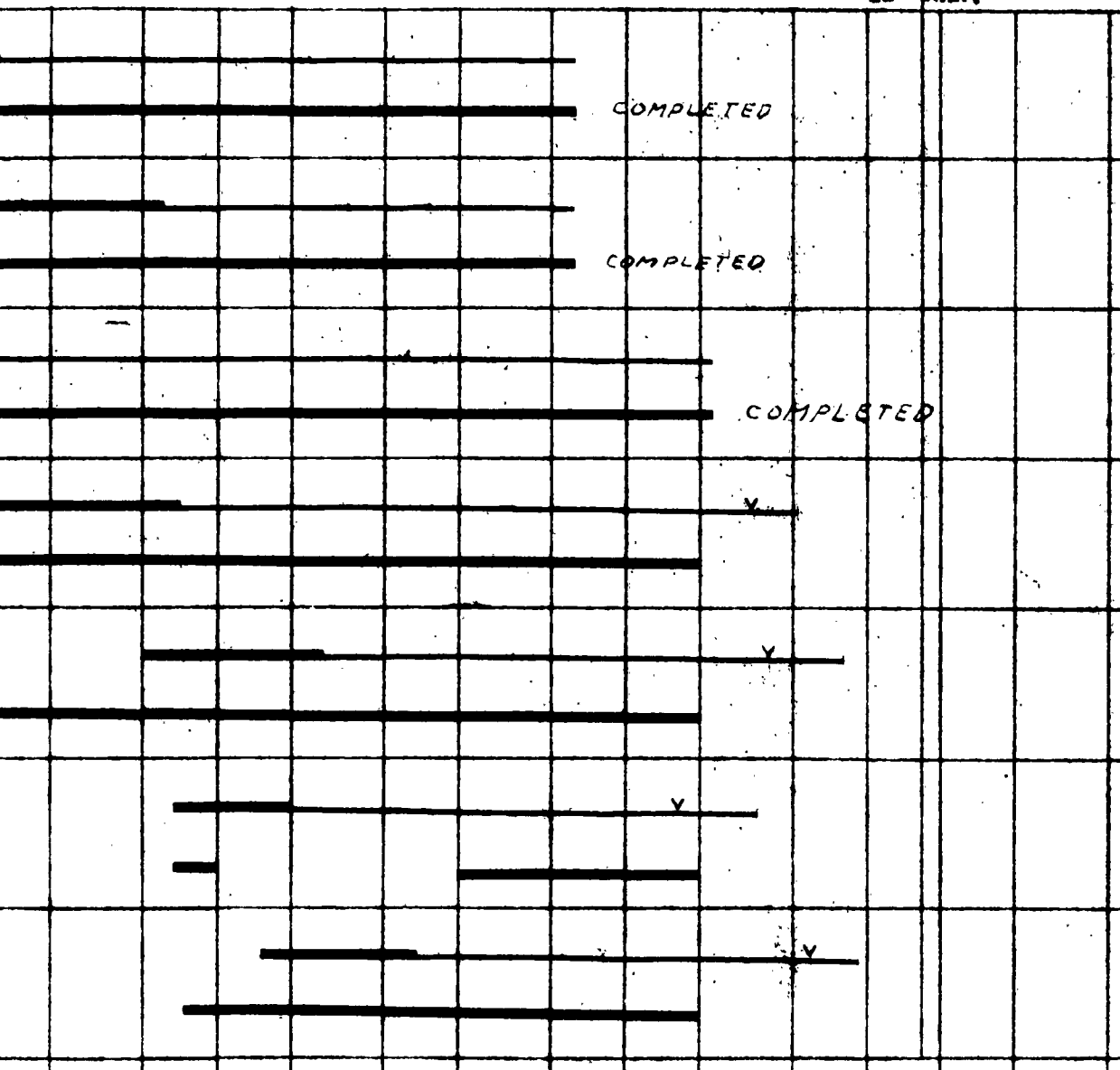
REPORT INTERVAL 1 NOV. 1962 TO 1 DEC. 1962

DWG. NO.

IIT 8, MODULATOR & POWER SUPPLY

DEL. 21 MAR.

- NOTES -



PR MAY JUNE JULY AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY

- 1962 - - 1963 -

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UNIT 8

NOber 57072 AN/ZPA-36

SCHEDULE FOR -- UNIT 3 - RADOME

PHASE		CONTRACT AWARD #1 NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP
DESIGN	SCHED											
	ACT											COMPLETED
DRAFTING	SCHED											
	ACT			SUBCONTRACTED ITEM								
RELEASE PURCHASE ORDERS	SCHED											
	ACT											
RECRIPT OF PURCHASE PARTS	SCHED											
	ACT											
FABRICATION & ASSEMBLY	SCHED											
	ACT			SUBCONTRACTED ITEM								
TEST SPECS.	SCHED											
	ACT											
SUBMIT/UNIT TESTS	SCHED											
	ACT											

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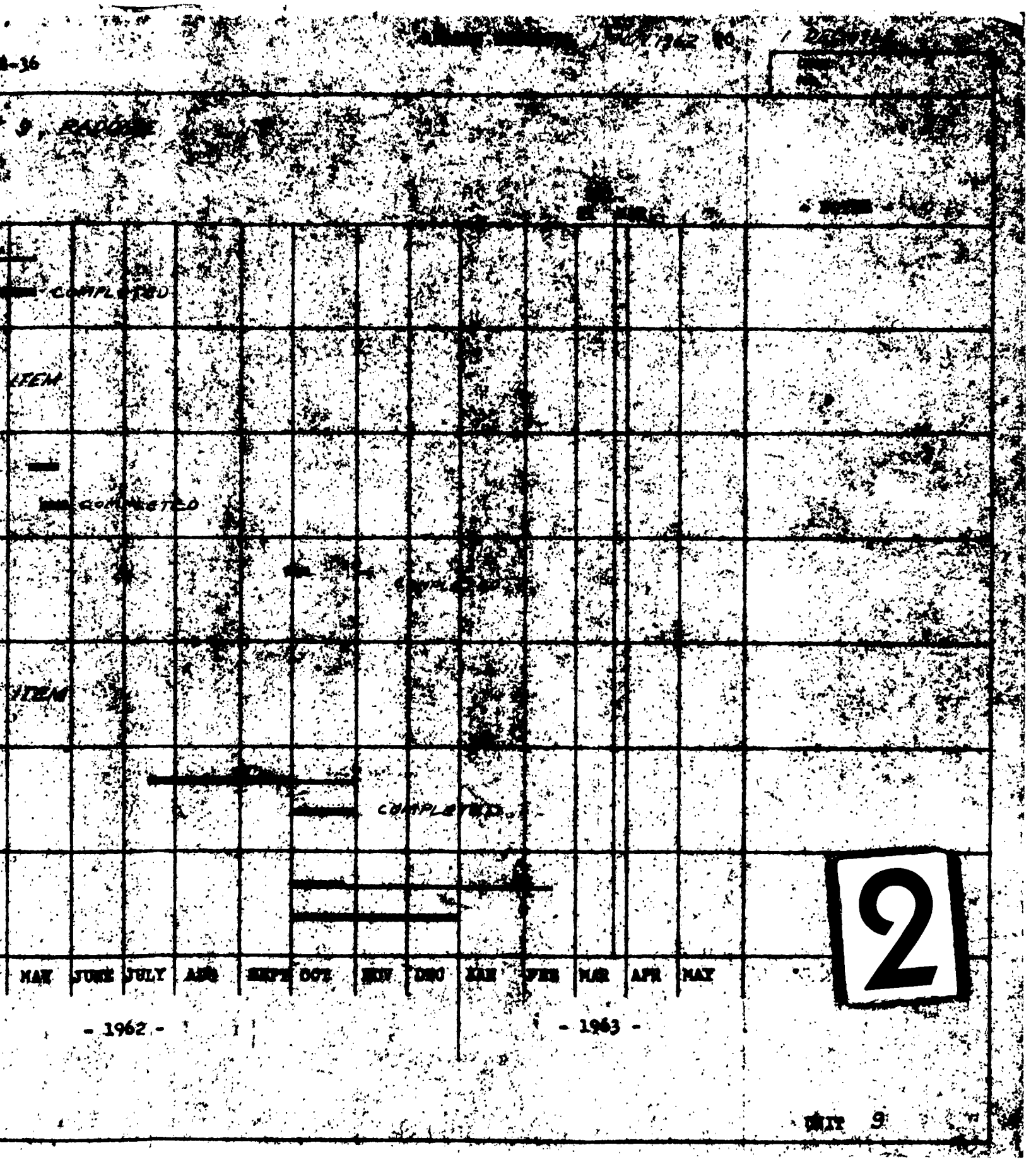
- 1961 - - 1962 -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ITEM
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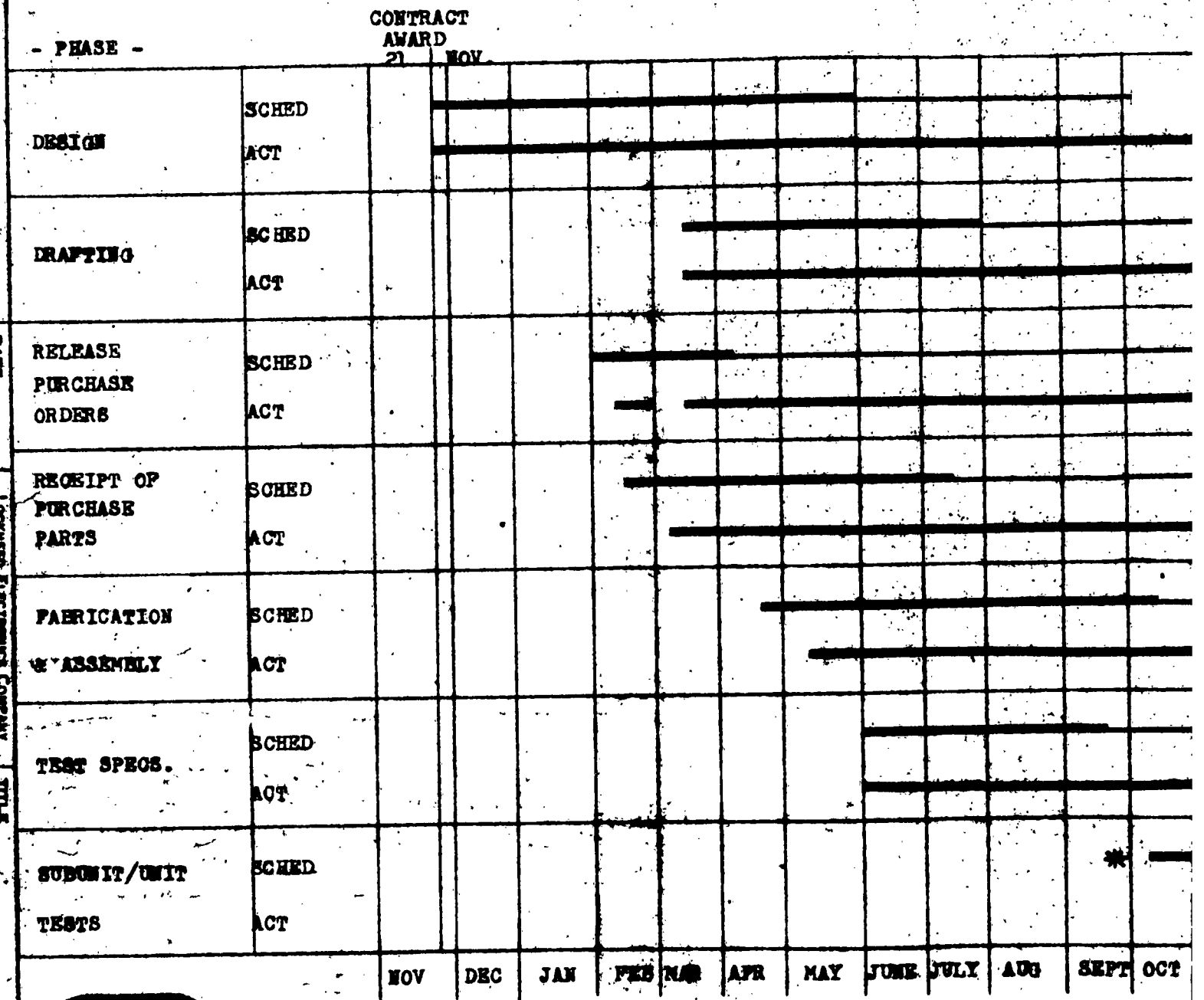
MAY JUNE JULY AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY
- 1962 -
- 1963 -

NObsr 87072 AN/TPS-36

SCHEDULE FOR -- UNIT 10, ANTENNA (FEED, PEDESTAL



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SHEET OF

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DWG. NO.

LOCKHEED ELECTRONICS COMPANY PLAINFIELD, N. J.

TITLE

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TPS-36

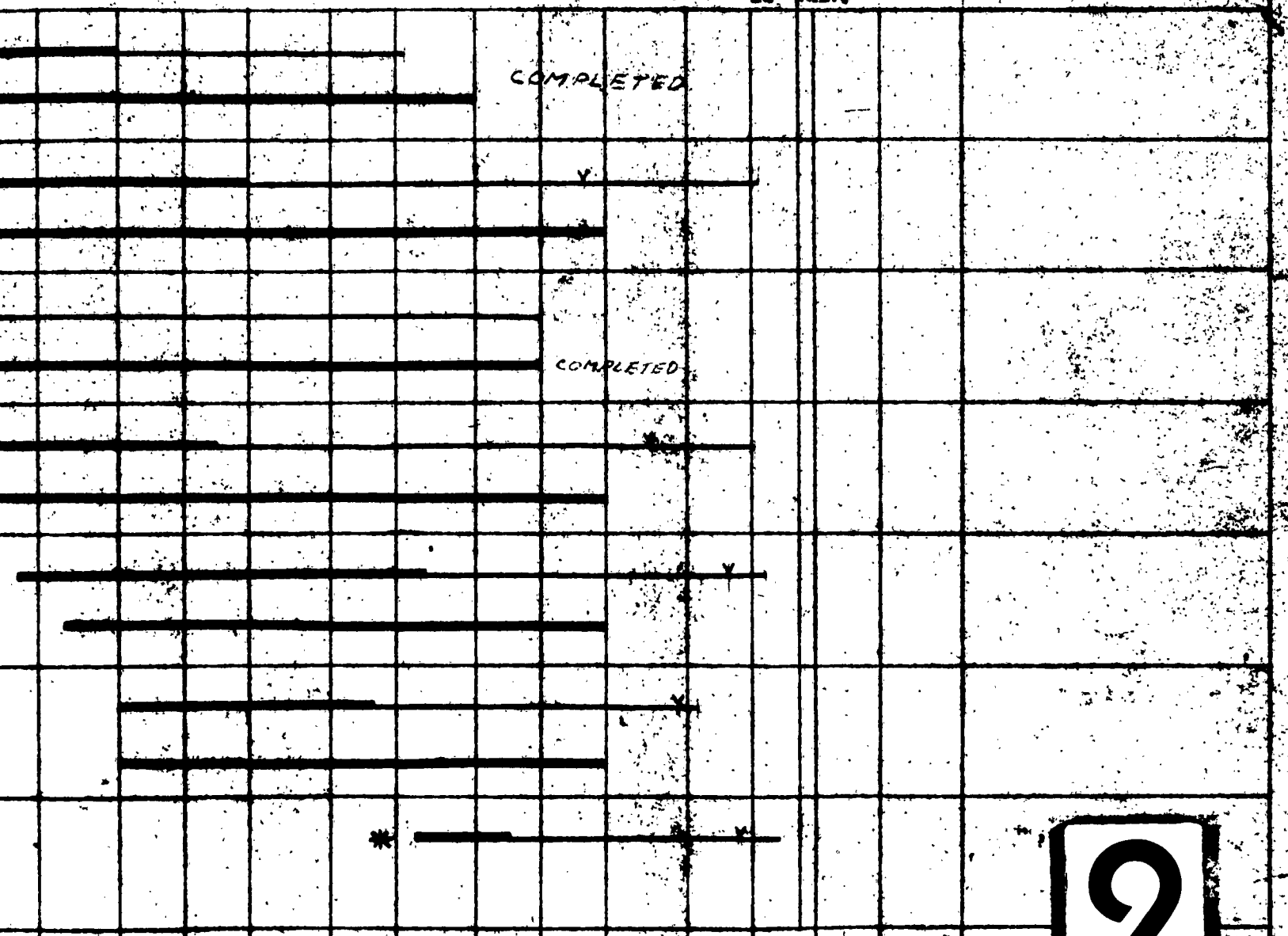
REPORT NUMBER 1 NOV 1962 TO 1 DEC 1962

DWG. NO.

T 10, ANTENNA (FEED, PEDESTAL, RF COMPONENTS)

DEC. 21 MAR.

- NOTES -



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ESTED CONCURRENTLY WITH SYSTEM TESTS

UNIT 10

3.4 SUMMARY OF TRIPS AND CONFERENCES

Name	Date	Activity Visited	Purpose/Remarks
D. N. Faber J. W. Kociolek	12/4/62	REF Dynamics Co. Mineola, L. I.	Discuss cabinet delivery
R. E. Shalvoy	12/6/62	RCA Lancaster, Pa.	Discuss A2766 tube
W. A. Blanchard	12/6/62	Empire Devices Amsterdam, N. Y.	Discuss mixer delivery
D. Maccarelli	12/10/62	Saffran Co. St. Clair Shores, Mich.	Titanium delivery
N. Huseland H. H. Jamjyan	12/13/62	Messrs. E. L. List and I. Borin of Litton Industries at LEC	MTDS Interface

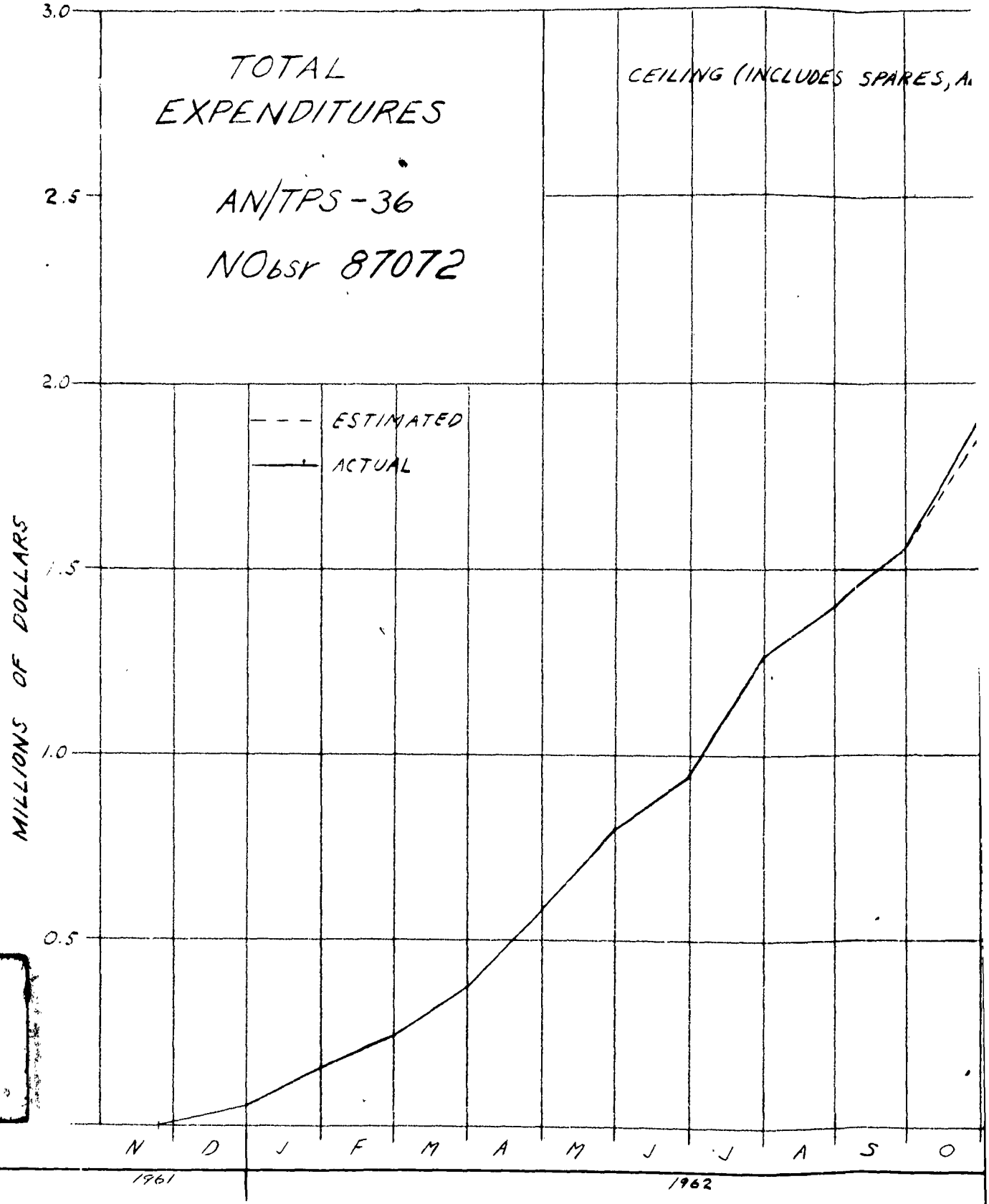
FORM NO. F108A

TOTAL EXPENDITURES

AN/TPS-36

NO6sr 87072

CEILING (INCLUDES SPARES, A



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PLAINFIELD, N. J.	
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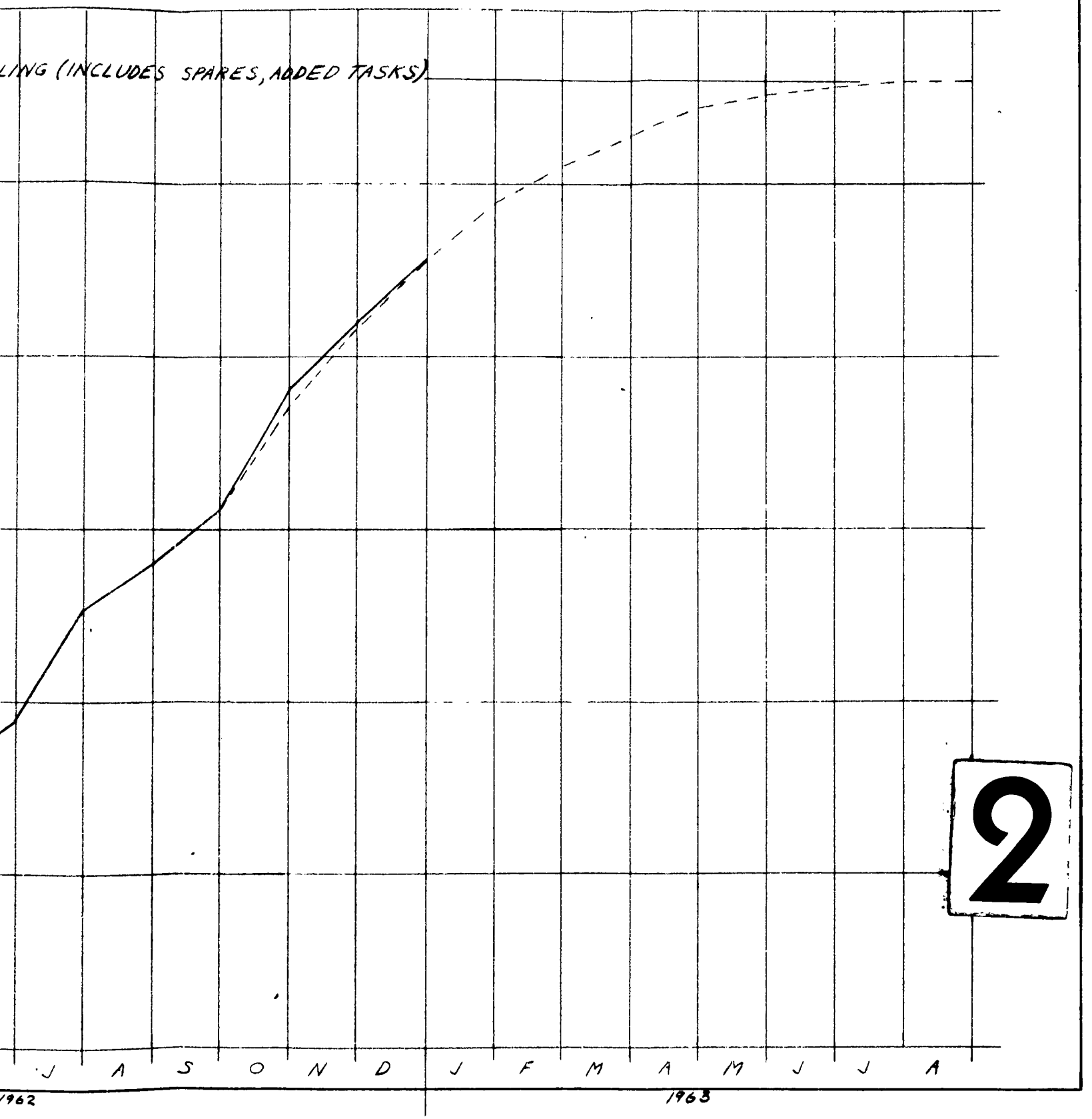
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4.0 CUSTOMER ACTION ITEMS

4.1 Approval to use non-standard parts previously approved on the AN/SPS-40, LEC letter dated 26 March 1962, 212-30/3-3025-0100.

4.2 Approval of request to use Titanium in place of Magnesium, LEC letter dated 5 September 1962, 212-30/125.

4.3 Request for NAVSHIPS 94357 for use in preparation of technical manual, LEC letter 22-1251-4000/243-11, dated 24 October 1962.

4.4 Request for approval of the System and Environmental Test Plan, LEC letter 212-30/23-1251, dated 17 December 1962.